United States Patent

[11] **3,554,172**

[72] Inventor **Elmer Carl Kiekhaefer**
Winter Haven, Fla.

[21] Appl. No. **863,425**
[22] Filed **Oct. 1, 1969**
[45] Patented **Jan. 12, 1971**
[73] Assignee **Brunswick Corporation**
Chicago, Ill.
a corporation of Delaware

[54] **REED BLOCK CRANKCASE INDUCTION FOR TWO-CYCLE ENGINE**
9 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **123/73**
[51] **Int. Cl.** **F02b 33/04**
[50] **Field of Search** 123/73V, 73D1, 73D, 73

[56] **References Cited**

UNITED STATES PATENTS

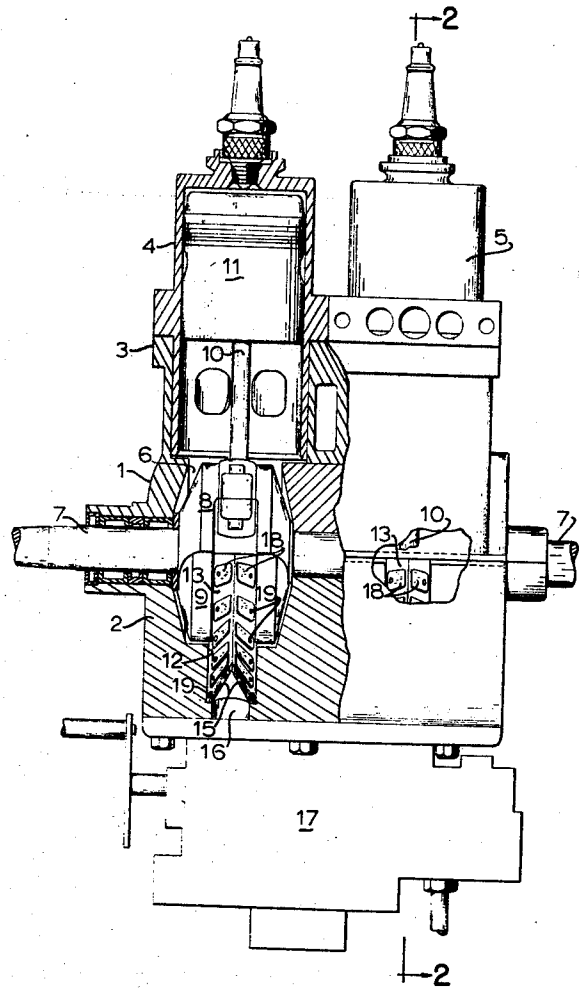
2,639,699	5/1953	Kiekhaefer	123/73
2,669,979	2/1954	Kiekhaefer	123/73
2,706,972	4/1955	Kiekhaefer	123/73

FOREIGN PATENTS

887,051	1/1962	Great Britain	123/73

Primary Examiner—Wendell E. Burns
Attorney—Roy T. Montgomery

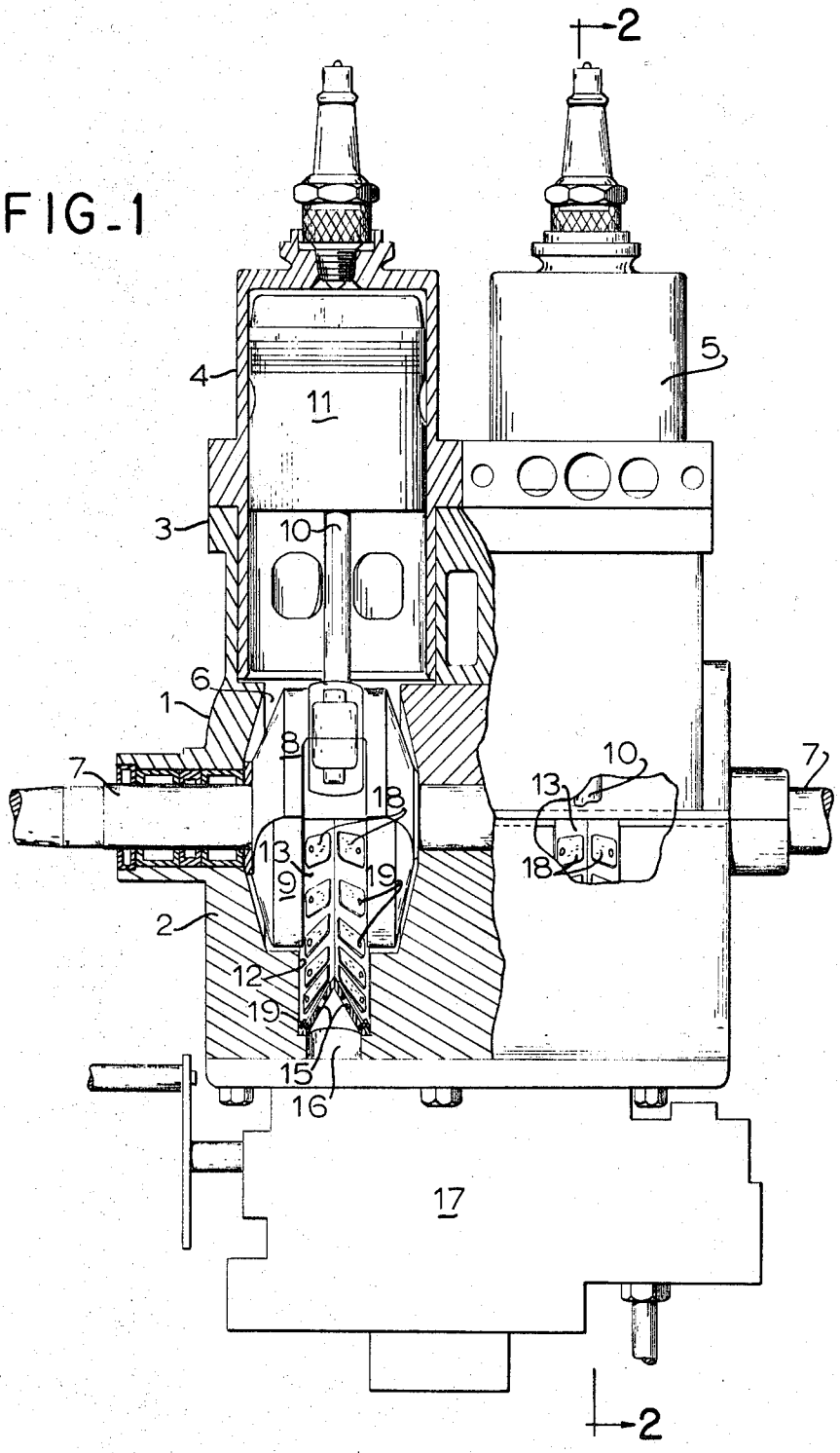
ABSTRACT: A V-type reed block extends circumferentially of the crankcase in excess of 60° and is curved to conserve space requirements within the crankcase chamber.



PATENTED JAN 12 1971

3,554,172

FIG-1



INVENTOR.
ELMER C. KIEKHAEFER
BY
Andrus, Sceales, Starke, & Sawall
Attorneys

PATENTED JAN 12 1971

3,554,172

SHEET 2 OF 2

FIG-2

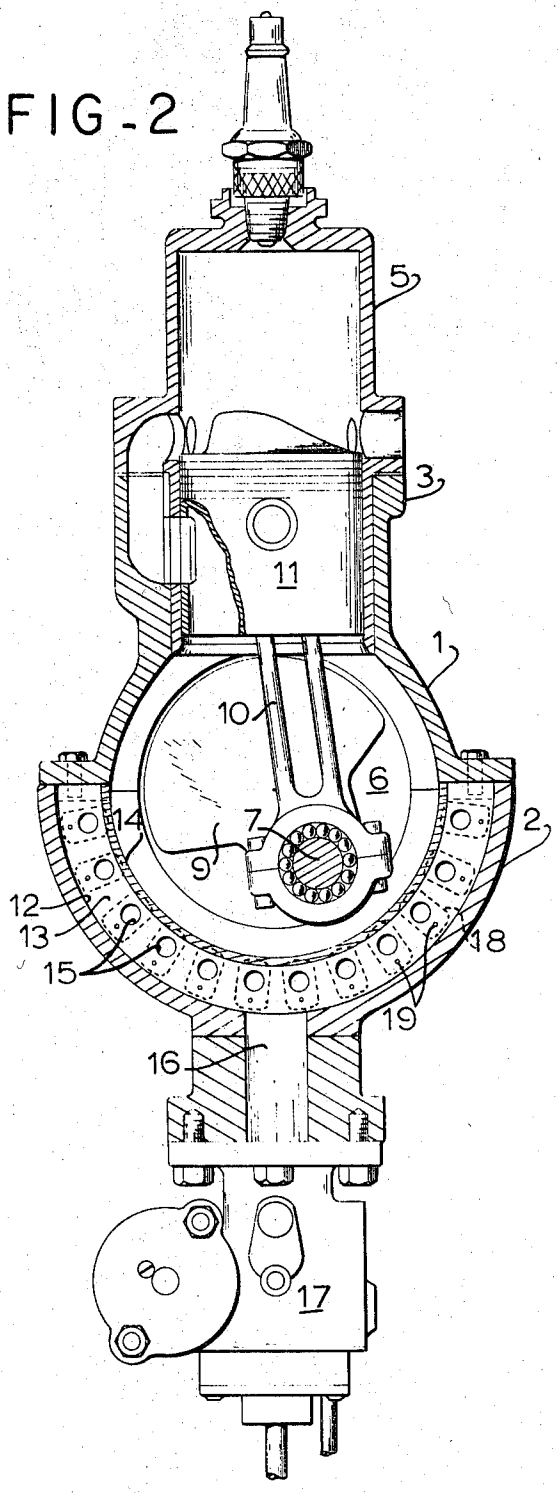
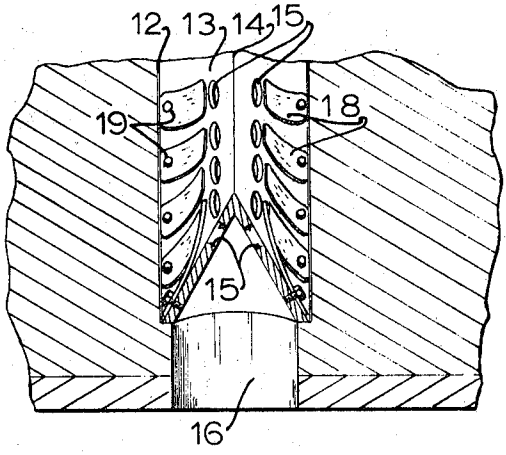


FIG-3



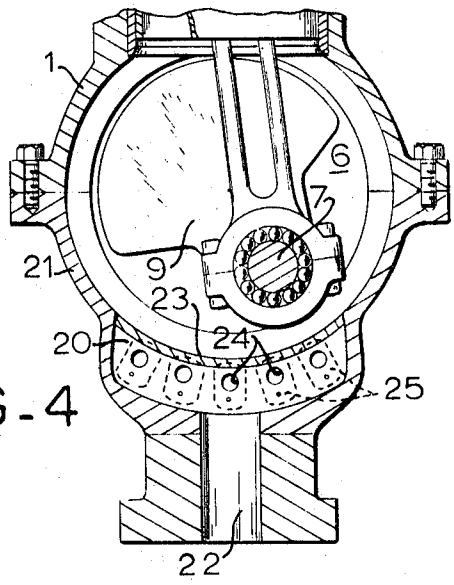


FIG-4

INVENTOR.
ELMER C. KIEKHAEFER
BY
Andrus, Sceales, Starke, & Sawall
Attorneys

REED BLOCK CRANKCASE INDUCTION FOR TWO-CYCLE ENGINE

BACKGROUND

This invention relates to an improved reed block crankcase induction for two-cycle engines and constitutes an improvement of the V-block construction illustrated in applicant's earlier U.S. Pat. No. 2,639,699.

The engine illustrated in the patent referred to employs a V-type reed block having a single reed controlled opening on each side and disposed in an opening in the crankcase wall directly opposite the cylinder and piston.

Reed blocks have been variously located relative to the crankcase and cylinder and in nearly all instances the block has been of limited length to avoid enlarging the crankcase chamber and thereby lessening of crankcase compression.

SUMMARY

According to the present invention the V-type reed block is curved generally corresponding to the curvature of the crankcase opposite the cylinder and is constructed to provide a series of reed-controlled valve openings on each side of the block.

The construction provides a substantially greater total area of reed valve opening than previously possible. At the same time, the construction keeps the capacity or volume of the crankcase at a minimum so that the desired crankcase compression is obtained.

DRAWINGS

The best mode contemplated for carrying out the invention is illustrated in the accompanying drawings in which:

FIG. 1 is a sectional view of a crankcase for a two-cycle two-cylinder engine taken axially of the crankcase and with parts in elevation;

FIG. 2 is a sectional view taken on line 2–2 of FIG. 1 with parts in elevation;

FIG. 3 is an enlarged view of a portion of FIG. 1 with the reeds flexed; and

FIG. 4 is a view similar to FIG. 2 showing a modified construction.

BRIEF DESCRIPTION

The crankcase illustrated is composed of two halves 1 and 2 flanged and bolted together along a central plane. Crankcase member 1 has a flange 3 to which the separate cylinders 4 and 5 are secured.

The crankcase members 1 and 2 cooperate to provide a crank chamber 6 for each cylinder, with end walls having suitable bearings in which the crankshaft 7 rotates.

The crankshaft 7 has a crank throw 8 and a counterweight 9 in each chamber 6, and a connecting rod 10 connects the throw 8 to the piston 11 in the corresponding cylinder.

Each crank chamber 6 is generally just large enough to accommodate the rotation of the corresponding crank 7, throw 8 and counterweight 9.

In carrying out the present invention for the embodiment of FIGS. 1 and 2 the lower crankcase member 2 has a semicircular recess which may be termed the induction chamber 12 and which receives a semicircular V-type reed block 13 for controlling the induction of gases to each crank chamber 6 for operation of the engine.

The block 13 is hollow and of V-shape with its apex 14 pointing inwardly toward the axis of rotation of the crankshaft 7. The outer periphery of the block 13 is sealed within member 2.

A series of spaced openings 15 extend through the opposite sidewalls of block 13 adjacent the apex 14 for induction of

fuel-oil mixture into the crank chamber 6.

The fuel-oil mixture generally referred to as gases is supplied to the block 13 by the passage 16 from carburetor 17 and which connects through the wall of member 2 to the hollow part of block 13.

The openings 15 are normally closed by individual reeds 18 secured by screws 19 to the corresponding sidewalls of block 13. When the piston moves outwardly in the corresponding cylinder a suction is created in chamber 6 which causes the reeds 18 to flex away from the sidewall of the block 13 and to thereby uncover the corresponding openings for induction of gases into the chamber 6 from the carburetor 17.

The reeds 18 are arranged radially of the crankshaft 7 and are secured at their outer ends so that flexing of the reeds results in uncovering the corresponding opening adjacent the apex, and the reed generally directs the gases toward the space between the crank arms and their counterweights, as shown in FIG. 3.

By reason of the large number of openings possible with the construction illustrated the amount of flexing for each reed may be reduced and the space for the induction chamber 12 may be kept at a minimum.

FIG. 4 illustrates a modification where the reed block 20 extends approximately 60°of the crank chamber instead of approximately 180°as in FIGS. 1 and 2.

In this FIG. 4 construction the crankcase member 21, corresponding to member 2 of the first embodiment, has a slot in its outer wall and which is closed by the V-block 20.

The inlet passage 22 is in communication with the block 20 and connects the same to the carburetor, not shown. The reed valves are similar in this construction to those of FIGS. 1—3.

The block 20 is otherwise similar to block 13 in having an apex 23 directed toward the crankshaft axis and having a series of side openings 24 covered by corresponding individual reeds 25.

I claim:

1. In a two-cycle engine having a crankshaft, a crankcase and an induction passage, the improvement comprising a curved V-shaped reed block extending on a radius from the crankshaft axis, the sidewalls of said block being angularly disposed to present an apex directed toward the crankshaft, said reed block having a series of circumferentially spaced openings in each sidewall thereof and corresponding individual reeds over each opening for controlling the induction of gases through said openings into the crankcase from said passage.

2. The construction of claim 1 wherein each said reed is secured to said block at the end farthest from the crankshaft axis.

3. The construction of claim 1 in which said reed block closes a slot in the back side of the crankcase.

4. The construction of claim 1 in which said reed block extends for at least 60° and is disposed in recess in the crank casing with the reeds extending radially of the crankshaft.

5. The construction of claim 4 wherein each said reed is secured to said block at the end farthest from the crankshaft axis.

6. The construction of claim 4 in which said reed block closes a slot in the back side of the crankcase.

7. The construction of claim 1 in which said reed block extends for approximately 180°and is disposed in a recess in the crank casing with the reeds extending radially of the crankshaft.

8. The construction of claim 7 wherein each said reed is secured to said block at the end farthest from the crankshaft axis.

9. The construction of claim 7 in which said reed block closes a slot in the back side of the crankcase.